



Zhao, M., & Wang, Y. (2018). Measuring segregation between rural migrants and local residents in urban China: an integrated spatio-social network analysis of Kecun in Guangzhou. *Environment and Planning B: Urban Analytics and City Science*, 45(3), 417-433.
<https://doi.org/10.1177/2399808317710658>

Peer reviewed version

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Environment and Planning B: Urban Analytics and City Science

Measuring Segregation between Rural Migrants and Local Residents in Urban China: An Integrated Spatio-social Network Analysis of Kecun in Guangzhou

Journal:	<i>Environment and Planning B: Urban Analytics and City Science</i>
Manuscript ID	EPB-2016-0158.R2
Manuscript Type:	Theme issue: Integrated spatial and social network analyses - by invitation only
Keywords:	segregation, Spatio-social Network Analysis, Mirgrants, China

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Measuring Segregation between Rural Migrants and Local Residents in Urban China: An Integrated Spatio-social Network Analysis of Kecun in Guangzhou

Abstract:

In this paper, we demonstrate an integrated spatio-social network analysis to measure the degree of segregation within a Chinese urban neighborhood in terms of the everyday activities by rural migrants and local urban residents at such routine venues as restaurants, grocery stores, barber shops, etc. Our data were collected in May 2014, through an integrated geographical and social survey conducted within an inner-city neighborhood around Kecun in south China’s Guangzhou Municipality. Although Kecun features a highly condensed and mixed dwelling pattern between the rural migrants and indigenous urban population, we find that, within our sample of 110 local and 132 migrant residents, ~~that~~ the former tend to socialize more inwardly with their peer locals and ~~more often~~ visit neighborhood amenities more often such as pubs, stadia, and public kindergartens. In contrast, the migrants tend to ~~more often~~ attend local roadside food stalls, outdoor recreation facilities, small clinic shops, grocery malls, and private (*minban*) kindergartens more often. Overall, only a modest degree of social interaction between the locals and migrants appears to exist in Kecun. On top of the methodological implications of our study, we argue that urban segregation in China is both socially and spatially different from its Anglo-American counterpart. More empirical research is needed to understand and assess social segregation underlying the everyday urban life in Chinese cities.

Keywords: Segregation; Spatio-social Network Analysis; Migrants; China

1. Introduction

In recent years, social segregation between rural migrants and local residents in Chinese cities has been extensively studied (eg., He et al., 2015; Liao and Wong, 2015; Liu et al., 2015; Zhu, 2016). While segregation research within the Chinese context resembles its Anglo-American counterpart in trying to identify the underlying social inequalities and injustices, it remains debatable whether segregation in China is empirically similar to what happens in the Anglophone world. The difference comes from two potential sources. First, segregation in Chinese cities appears to be based more on the rural-urban divide rather than on racial categories (Fan, 2003; He et al., 2015; Liu et al., 2015). Second, the spatial scale of segregation in China also tends to be more fine-grained and fuzzier, given the typically much higher population as well as dwelling density in urban China (McGee, 1991; Heikkila et al., 2003; Whitehand and Gu, 2006).

Social network analysis (SNA) proves to be an innovative way to assess and help understand segregation beyond the conventional race-and-residence-based perspective (Arie and Mesch, 2015; Halberstam and Knight, 2016). A particular strength of SNA lies in its conceptualization of “cross-place concentrations”, for example, of telecommunication between different social groups as an alternative to “framing the residential area as the locus of racial/ethnic concentration” (Montgomery, 2011:659). However, routine urban activities such as commuting, shopping and eating out do take place in actual rather than virtual space. How to adapt and apply seemingly “techy” SNA to study the everyday urban life in general and social segregation in particular constitutes a key intellectual motive of our research.

Specifically, in this paper we intend to demonstrate an integrated spatio-social network analysis to gauge the degree of everyday segregation between rural migrants and local residents within a Chinese city. Our study area is Kecun (see Figure 2), a typical inner city neighborhood shared by rural migrants and local residents within the municipality of Guangzhou in south China. Notwithstanding a highly mixed housing pattern between the migrants and local population, the social dissimilarity index calculated based on the individual respondents’ everyday activities, such as eating out at a local food stall, turns out to be as high as 0.625 given the index range of $[0,1]$, suggesting the residentially mixed neighborhood to be nonetheless rather segregated when gauged in certain aspects of routine urban life. Apart from showcasing a new segregation measurement, we call for policy efforts to encourage everyday social interactions between rural migrants and the local population in urban China.

The remainder of the paper is organized as follows. Section 2 is intended to identify the characteristics of social segregation in urban China through a comparative literature review. This is followed by section 3, which scans the latest progress in ~~SNA~~^{social network analysis} on which we elaborate on an integrated spatio-social network analysis approach to measuring the degree of segregation in terms of the everyday use of neighborhood facilities by migrants and local people. Section 4 presents the case study area and data collection process. Sections 5 and 6 report and discuss the results, respectively, before proceeding to the conclusions and our plans for future research in section 7.

2. Segregation with Chinese characteristics

In the Anglophone world, the term “segregation” usually has a negative connotation, because discriminative racial apartheid, typically between Caucasians and Black populations was once institutionalized and enforced in English-speaking countries such as the United States of America and South Africa until the second half of the 20th century (Massey and Denton, 1993). Although decades have passed since the 1960s’ Civil Rights Movement in the United States of America, covert forms of racial segregation, for example, the exclusionary zoning against ethnic minorities in the housing sector, remain a major social problem in contemporary USA (Seitles, 1998; Massey and Rothwell, 2009; Brazil, 2016).¹ Accordingly, the mainstream English literature on urban segregation has featured a strong racial orientation, although research on income and class-based segregation has also seen a rising trend in recent years (e.g., Sethi and Somanathan, 2004; Huffman and Cohen, 2004).

Another, albeit less explicit, feature of the Anglo-American segregation literature is its focus on geographic location and spatial structure. For instance, racial segregation in the residential and labor markets constitutes two classic research topics in the field (e.g., Yinger, 1976; Clark, 1988; Kain, 1992), partly because both issues are perceived by the general public, but arguably also because the physical locations of homes and places of employment are readily captured in the US Census. There is actually a longstanding intellectual tradition of quantitative spatial analysis in segregation research, dating from Schelling (1971), Massey and Denton (1988), Wong (1993) to more recent research, which sees a diversity of computerized spatial analytical tools being widely applied in the subject area (Fossett and Warren, 2005; Apparicio et al., 2008; Zhang, 2011; Wang, 2015).

Urban segregation in China is, however, a quite different story. Although most China-based segregation research shares the moral commitment to condemn the underlying social inequalities and injustices, it differs from Anglo-American scholarship in two important ways. First, segregation in Chinese cities is arguably less about race or ethnicity, and more about the rural-urban divide, which has been institutionalized in China’s official household registration or *hukou* system since the socialist era. The Chinese state aims to provide differentiated public services to people of urban versus rural origins, which has been identified as a major cause of social segregation between the rural migrants and local residents within Chinese cities, whether in terms of residential pattern (He et al., 2015; Liao and Wong, 2015), access to job opportunities (Fan, 2003; Zhu, 2016), or social security and welfare entitlements (Liu et al., 2015).

Adding to the complexity is the second difference in terms of the spatial scale of segregation within Chinese cities. China’s average urban density is estimated to be 5,700 persons per square meter, compared with 1,200 in the US, not to mention that megacities in China, such as Beijing, Shanghai and Guangzhou, each accommodate roughly 20 million regular residents within their metropolitan boundaries (Demographia World

¹ For example, the 2014 riot in the town of Ferguson, Missouri is considered to be mainly instigated by racial tensions between the segregated local Black residents and the White-dominated police force.

Urban Areas, 2016). The much higher population density causes the urban form of Chinese cities to evolve rather differently from their Western counterparts in general and, in particular, to blur the geographic delineation between the city proper and the peripheral countryside, leading to the so-called “*desakota*” regions as populated interplay between Chinese cities and their surrounding rural areas (Heikkila et al., 2003; McGee, 1991; Whitehand and Gu, 2006).

Accordingly, the spatial scale of segregation in Chinese cities is much more fine-grained, often due to the highly condensed migrants and local population mix, sometimes even within a geographically very small neighborhood. In this vein, the conventional spatial unit of segregation analysis in the American context, such as census tract, is arguably too coarse in the Chinese scenario, and if analyzed by purely location-based segregation measures, such as the classic dissimilarity index, tends to underestimate or even overlook the actual degree of social segregation, posing a typical ecological fallacy due to the underlying modifiable areal unit problem (Openshaw, 1984).

3. An integrated spatio-social network analysis approach

3.1 Progress in social network analysis

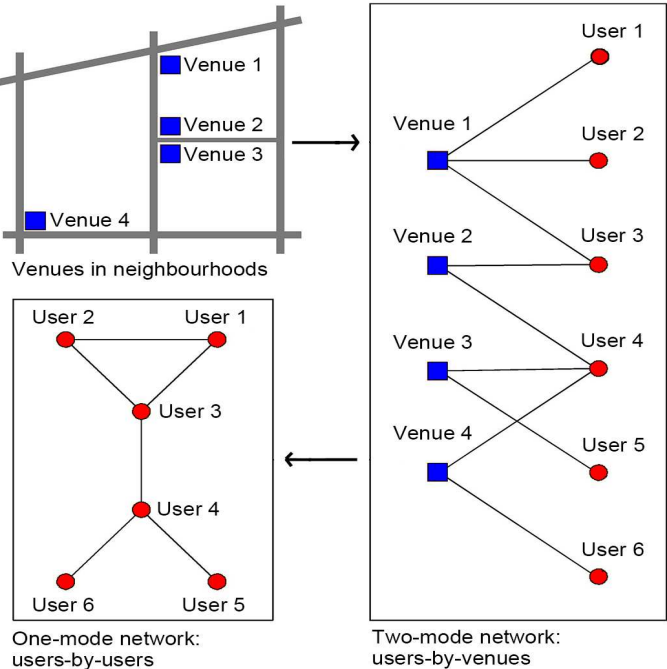
How can urban segregation in China be measured, given its social and spatial characteristics as mentioned above? This is the central research question of our paper, which we intend to address by referring to the rapidly expanding literature on ~~SNA~~^{social network analysis (SNA)}.

A key strength of SNA, when applied to measure segregation, lies in its non-preoccupation with physical space, let alone residential location. For example, Montgomery’s (2011) conceptual work “focuses on cross-place concentrations” of telecommunication between different social groups vis-à-vis “framing the residential area as the locus of racial/ethnic concentration” (p.659). Arie and Mesch (2015) empirically assess the social segregation between Arab versus Jewish Israelis in terms of their mobile phone usage, while the same type of data source was also deployed by Järv et al (2012). An intriguing recent publication is by Halberstam and Knight (2016), who track Twitter users’ online connections to identify social separation in terms of political opinions.

However, virtual space cannot fully replace the actual built environment, especially when it comes to studying everyday urban activities such as commuting, shopping and eating out. Indeed, one may even argue that the social and spatial dimensions of urban life are always correlated (Casey, 2001)² while SNA is not preoccupied with the accounting of physical location, nor is it precluded from doing so. In fact, there is an expanding literature on the analysis of location-and-activity-based two-mode social networks, which has emerged as an extension ~~to~~^{of} the conventional social group based one-mode SNA (Faust, 1997; Borgatti, 2010; Chorley et al., 2015; Pelechris and Krishnamurthy, 2016). The methodological framework used in our study builds directly upon this important recent progress in the intellectual field of SNA.

2 As Edward Casey (2001: 687) put it, “In effect, there is no place without self and no self without place”.

Figure 1: Two-mode versus one-mode networks



3.2 Measuring segregation within the two-mode network

Figure 1 presents two types of network. Assume a neighborhood that contains a definite number of physical venues (e.g., a house, restaurant, bus stop, etc.), each of which accommodates a specific activity or event attended by certain human users. Since every venue also occupies a discrete geographic location, a two-mode location-and-activity-based users-by-venues spatial network can be visualized as on the right-hand side of Figure 1. This two-mode network can be further converted into a one-mode users-by-users social network as illustrated in the left-bottom corner of Figure 1.

The segregation of human users within the two-mode spatial network can be measured by adapting the conventional dissimilarity index originally proposed by Taeuber and Taeuber (1965). Assume two mutually-exclusive user groups, for example, with F denoting floating rural migrants and L standing for local urban residents. n_F gauges the number of migrant users, while n_L counts the local users. Further define $A_{i,k}$ as a binary indicator for the presence of individual user i at venue k . If venue k is visited by user i , then $A_{i,k}=1$; otherwise $A_{i,k}=0$.

Based on the above specification, equation (1) calculates a dissimilarity index, S^A_k , within the two-mode users-by-venues network. Like the conventional dissimilarity index, S^A_k in equation (1) has a numerical range of $[0, 1]$. The larger the value of S^A_k is, the greater the degree of segregation in venue k between the two user groups, F and L will be.

$$S^A_k = \frac{1}{\sum_i A_{i,k}} \left| \sum_{i \in F} A_{i,k} - \sum_{j \in L} A_{j,k} \right| \quad (1)$$

S^A_k as an absolute dissimilarity index can be further calibrated by taking n_F and n_L into account (see a similar adaptation by Wong, 1993). Equation (2) calculates the relative dissimilarity index S^R_k . $S^R_k = -1$, if all of the migrant users visit venue k , while none of the local citizens use the facility. $S^R_k = +1$, if all the local users attend venue k , but no migrant user shows up at the same location.

$$S^R_k = \frac{1}{n_L} \cdot \sum_{i \in L} A_{i,k} - \frac{1}{n_F} \cdot \sum_{i \in F} A_{i,k} \quad (2)$$

3.3 Measuring segregation within the one-mode network

There are a variety of ways to define interaction within a one-mode social network based on co-behaviors displayed in the two-mode network. For instance, Neal (2014) developed a stochastic degree sequence model to construct empirical edge weight distributions from random bipartite networks with stochastic marginal elements. Alternatively, Derudder and Liu (2015) have projected the two-mode network into a symmetrical one-mode interaction network detailing the geography of interactions between users from two groups. In this paper, we follow Faust (1997) and Borgatti (2010) by assessing the strength of the social connection between two individual users based upon the frequency of co-presence at all venues or activity locations.

For example, $A_{i,k} \cdot A_{j,k} = 1$ indicates that the two users, i and j , both attend venue k . In equation (3), U_{i-j} counts the co-presence of user i and j at all venues. The larger the value of U_{i-j} is, the more connected the users i and j will be in terms of their social activities. D^c_i in equation (4) gauges the difference in user i 's average connectivity with other users from group F versus those from group L . Segregation within this one-mode network can be measured aggregately by calculating S^{EI} as per equation (5). $S^{EI} = +1$ if all of the inter-user connections are between-group. $S^{EI} = -1$ if all the links are within-group.

$$U_{i-j} = \sum_k A_{i,k} \cdot A_{j,k} \quad (3)$$

$$D^c_i = \begin{cases} \frac{1}{n_L - 1} \cdot \sum_{j \in L} U_{i-j} - \frac{1}{n_F} \cdot \sum_{j \in F} U_{i-j} & i \in L \\ \frac{1}{n_L} \cdot \sum_{j \in L} U_{i-j} - \frac{1}{n_F - 1} \cdot \sum_{j \in F} U_{i-j} & i \in F \end{cases} \quad (4)$$

$$S^{EI} = \frac{1}{\sum_i \sum_j U_{i-j}} \left[\sum_{i \in F} \sum_{j \in L} U_{i-j} - \left(\sum_{i \in F} \sum_{j \in F} U_{i-j} + \sum_{i \in L} \sum_{j \in L} U_{i-j} \right) \right] \quad (5)$$

4. The case of Kecun

4.1 Study area

Located on the south bank of the Pearl River and within the city boundary of Guangzhou, the neighborhood around Kucun is a typical small inner-city area (roughly 1.2 square kilometers inby size), which, however, features a highly condensed and mixed dwelling pattern between local indigenous residents and rural migrants from elsewhere in China.

Figure 2: The location of Kecun in Guangzhou

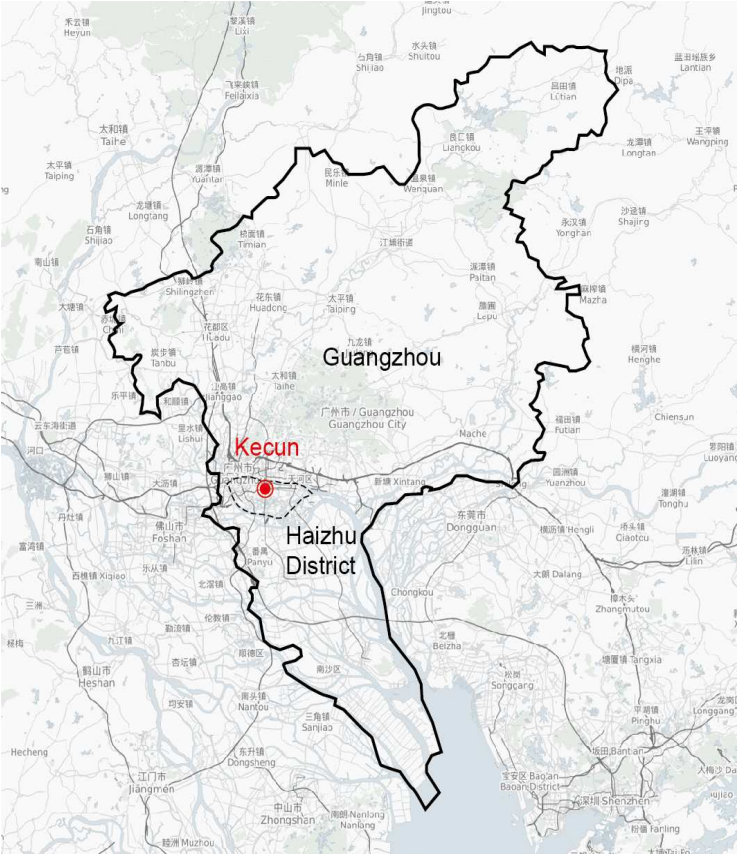


Figure 3: Mixed dwelling pattern in Kecun

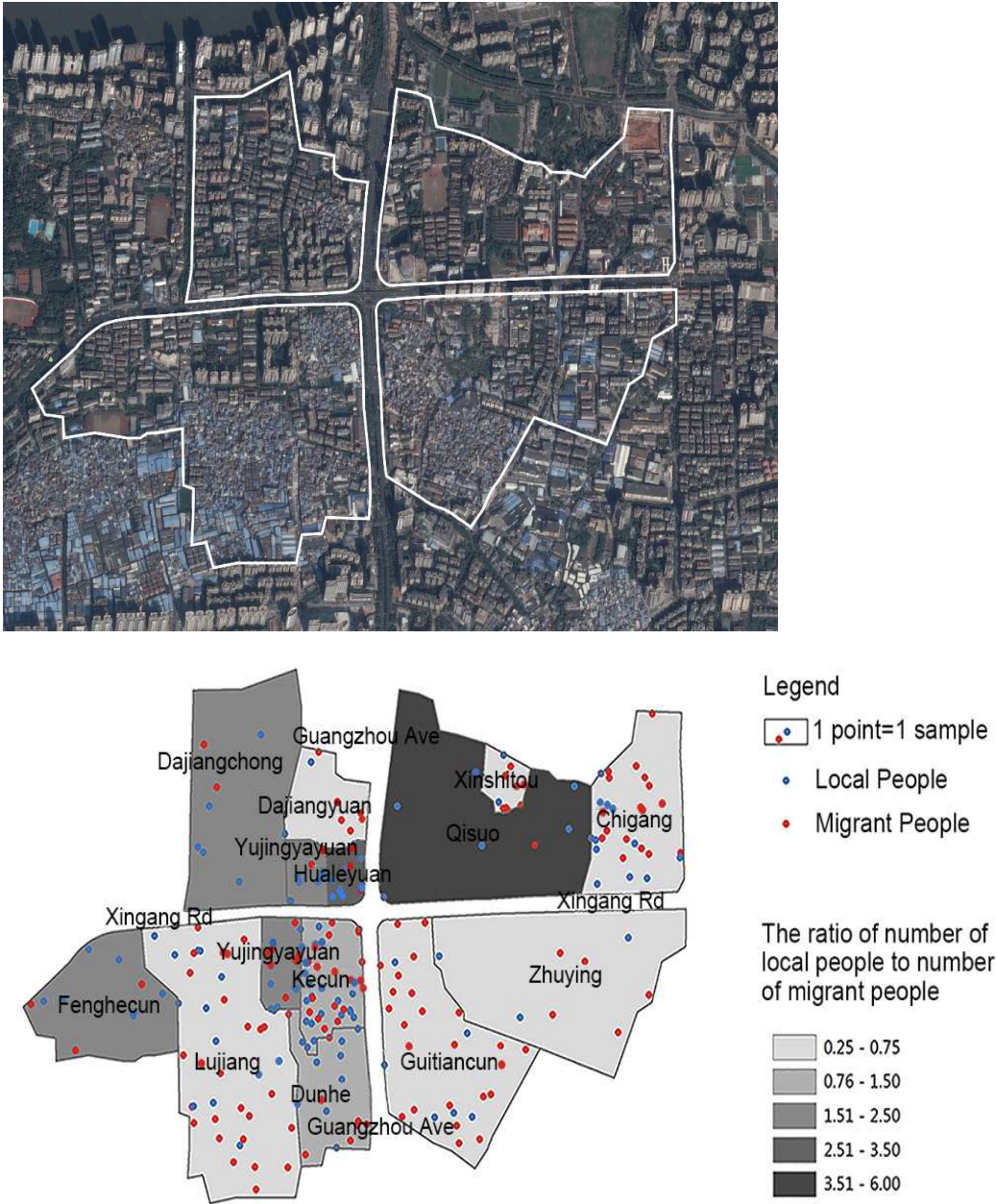


Table 1: Respondents' demographic information

		Local	Migrant	Total
Gender	Male	45	79	124
	Female	65	53	118
Age	18-25	21	31	52
	26-35	28	36	64
	36-45	25	33	58
	46-55	22	18	40
	56-65	14	14	28
Education	Master degree	2	-	2
	College	58	42	100
	Secondary school	41	73	114
	Elementary school	9	17	26
Total		110	132	242

Figure 3 illustrates a satellite image and the distribution of the local versus migrant population across 13 subordinate residential blocks (including the block of Kecun itself, although we use Kecun hereafter to refer to the entire neighborhood containing all of the 13 blocks), based on the responses we collected in May 2014 from a sample of 242 survey participants. Notwithstanding the variance between subordinate blocks, the neighborhood around Kecun as a whole seems to display a relatively even mix of local (in blue points) and migrant (in red points) residents, given the summary sample data reported in Table 1.

In terms of the sampling framework, we deployed a geographical cluster sampling strategy by treating each of the 13 residential blocks as a statistical cluster, which contains a block-level subsample of local versus migrant residents in Kecun based on household registration status or *hukou*. A total of 250 copies of questionnaires were circulated among the target respondents and 242 were successfully returned during May 2014. A high response rate of 96.8% was achieved, not only because two pilots had been exercised beforehand in the locality, but also because most of the questionnaire surveys were conducted face-to-face between the researchers and respondents, often directly at the corresponding activity venues, such as a food stall or a shopping mall. However, it should also be acknowledged that, given the cluster sampling approach we deployed, our sample observations should not be deemed entirely random and independent. Thus discretion is necessary when trying to test our data using standard inferential statistical methods.

4.2 Activity venues

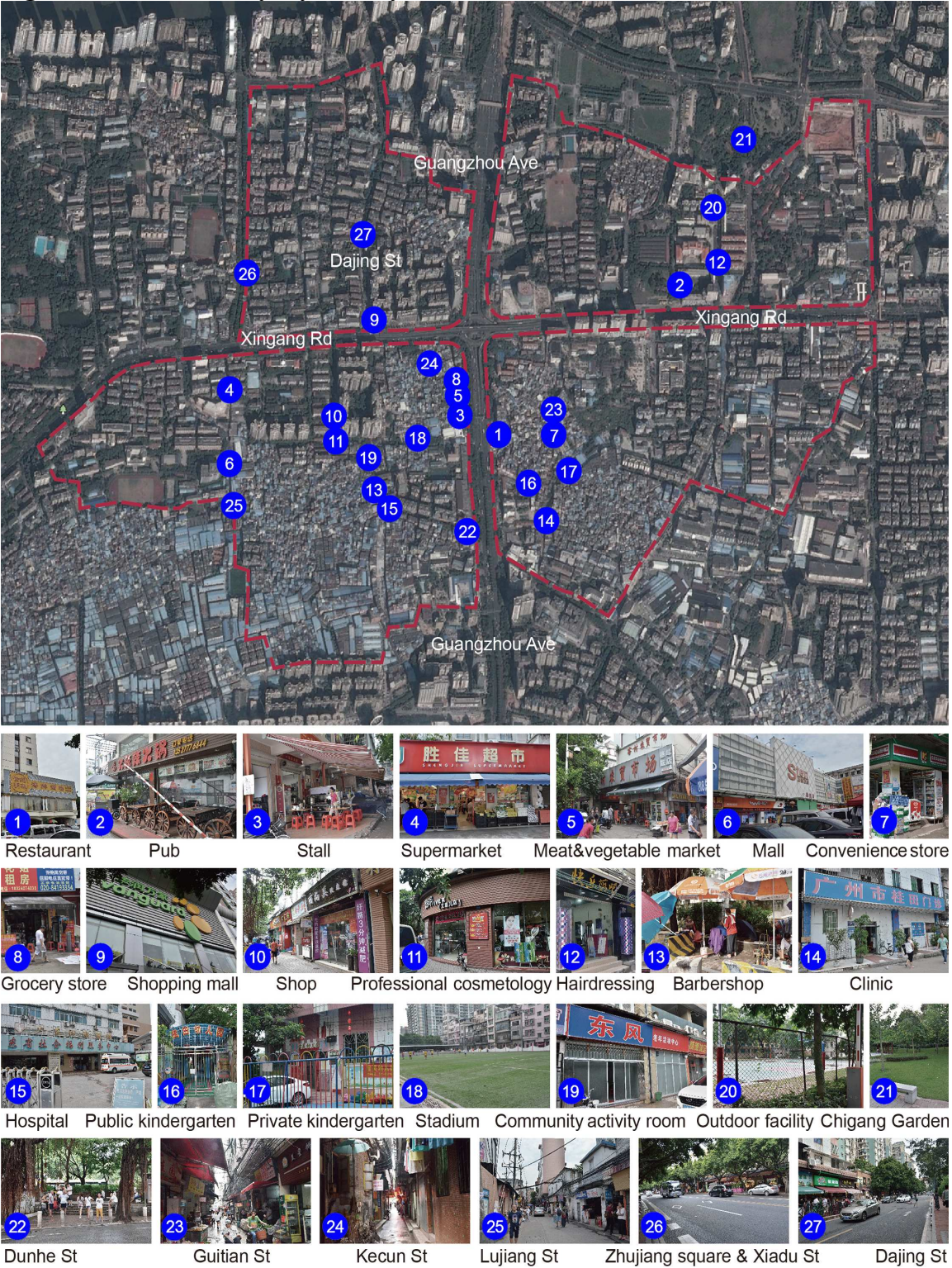
As mentioned in the literature section, measuring segregation using the conventional residential location based method may yield biases, especially with respect to our case study of Kecun. First, because the inner-city neighborhood around Kecun, as is typical in China, features a very high housing density, residential segregation is less likely to be

identified. For example, although there is a conceivable variance in terms of the degree of local-migrant mix between the 13 subordinate blocks (as shown in Figure 3 by different shades of gray), only calculating the aggregate neighborhood segregation index in Kecun tends to disguise such internal variance. Second, recent research by Farber et al. (2014, 2015), among others, further points out that segregation cannot only be measured by more individualized activities such as housing and working, but also by social interactions when people go shopping and travelling, for instance.

In the case of Kecun, both the local and migrant residents, apart from living in the same neighborhood, also engage in routine socialization such as grocery shopping, eating out and entertainment. The spatio-social network analysis approach presented above would enable us to quantify both the user-venue and user-user relations underlying the everyday-life activities in Kecun. More importantly, the segregation index measured within this framework is less susceptible to the spatial scale effect or the modifiable areal unit problem, since every activity venue (e.g., a roadside food stall) may be considered to occupy a discrete location point, whether observed at the neighborhood or block scale.

Figure 4 maps the everyday activity venues we had selected for this research. These include both local commercial and public amenities such as supermarkets and hospitals as well as public open spaces such as local streets and communal gardens. A structured questionnaire was distributed within the neighborhood around Kecun in May 2014 to collect the relevant information about local users' attendance at each of the 27 selected venues in Figure 4. Valid responses were received from 242 respondents, whose basic demographic information is summarized in Table 1.

Figure 4: Selected everyday activity venues in Kecun



5. Everyday segregation in Kecun

5.1 Segregation in the user-by-venue spatial network

Table 2 compares the number of local versus migrant users of the various commercial and public amenities within Kecun. The absolute and relative dissimilarity indexes (i.e., S^A_k and S^R_k) are calculated correspondingly for each amenity venue. In the case of S^A_k , its lowest value is 0.000 in terms of the local versus migrant residents' presence at the selected restaurant, because there is an exactly equal number (i.e., 44) of restaurant users between the two population groups. The highest value of S^A_k in Table 2 is 0.625, indicating a considerable degree of segregation in terms of the two groups of respondents' presence at the selected local food stall. $S^R_k = -0.285$ further indicates that there are far more migrant residents visiting the food stalls than the locals. A similar albeit less severe degree of dominance by migrants also exists in terms of the users of outdoor recreation facilities ($S^A_k = 0.273$; $S^R_k = -0.217$), clinics ($S^A_k = 0.455$; $S^R_k = -0.200$), grocery malls ($S^A_k = 0.429$; $S^R_k = -0.158$) and private kindergartens ($S^A_k = 0.308$; $S^R_k = -0.094$). In contrast, more local residents tend to visit pubs ($S^A_k = 0.200$; $S^R_k = 0.218$), stadiums ($S^A_k = 0.245$; $S^R_k = 0.148$), and public kindergartens ($S^A_k = 0.244$; $S^R_k = 0.146$). Likewise, Table 3 compares the local versus migrant residents' presence at the selected public open space venues. More migrants tend to show up at Guitian Street ($S^A_k = 0.375$; $S^R_k = -0.038$), for example.

Table 2: Segregation between local and migrant users of key amenities in Kecun

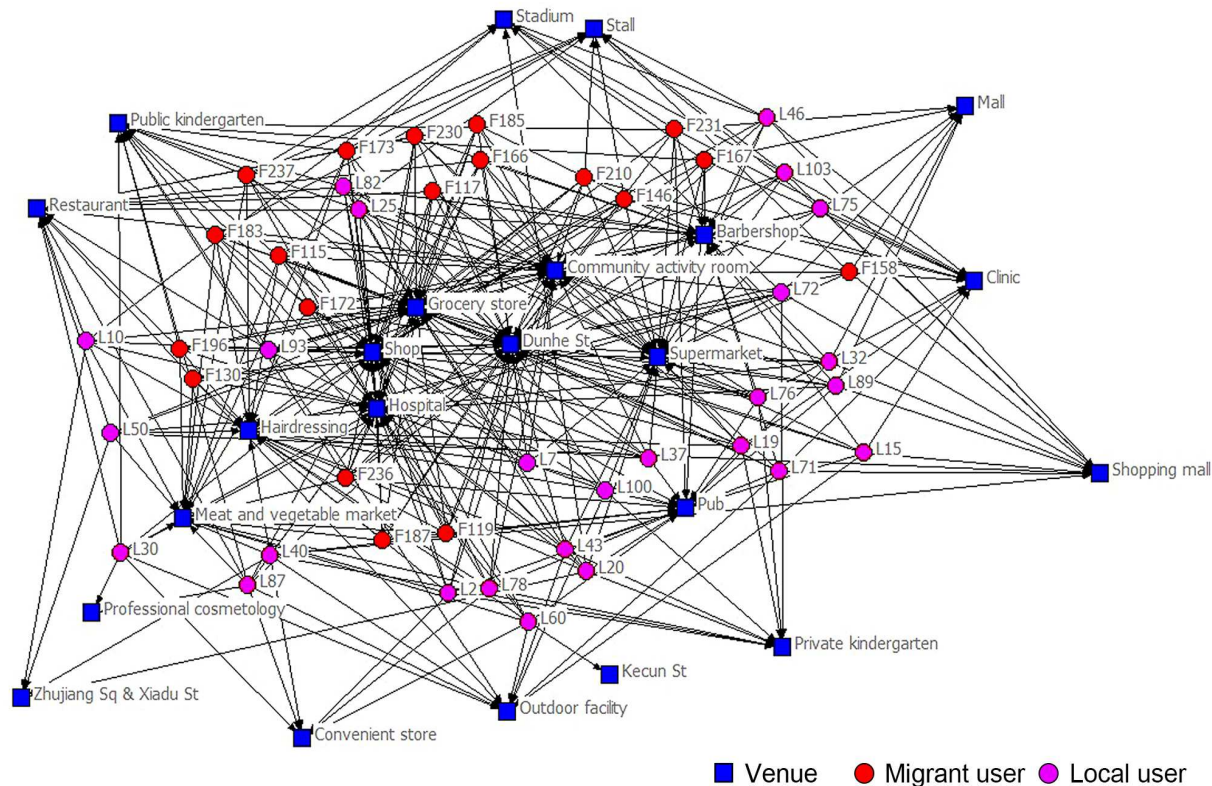
Type	Venues of Facilities	Number of Users		Absolute Dissimilarity	Relative Dissimilarity
		Local	Migrant	S^A_k	S^R_k
Catering Facilities	Restaurant	44	44	0.000	0.067
	Pub	54	36	0.200	0.218
	Food Stall	12	52	0.625	-0.285
Food	Supermarket	62	73	0.081	0.011
	Meat & Vegetable Market	48	59	0.103	-0.011
Daily Groceries	Mall	16	40	0.429	-0.158
	Convenience Store	22	14	0.222	0.094
	Grocery Store	72	78	0.040	0.064
Leisure & Shopping	Shopping Mall	37	45	0.098	-0.005
	Shop	73	87	0.088	0.005
Cosmetology & Hairdressing	Professional Cosmetology	4	3	0.143	0.014
	Hairdressing	73	72	0.007	0.118
	Barbershop	33	56	0.258	-0.124
Medical Care Facilities	Clinic	18	48	0.455	-0.200
	Hospital	92	84	0.045	0.200
Early Childhood Education	Private Kindergarten	18	34	0.308	-0.094
	Public Kindergarten	28	17	0.244	0.126
Recreational Facilities	Community Activity Room	25	21	0.087	0.068
	Outdoor Facility	52	91	0.273	-0.217
	Stadium	33	20	0.245	0.148

Table 3: Segregation between local and migrant users of open space in Kecun

Venues of open space	Number of Users		Absolute Dissimilarity	Relative Dissimilarity
	Local	Migrant	S^d_k	S^R_k
Chigang Garden	8	15	0.304	-0.041
Dajing St	12	7	0.263	0.056
Dunhe St	21	19	0.050	0.047
Guitian St	5	11	0.375	-0.038
Kecun St	10	20	0.333	-0.061
Lujiang St	13	24	0.297	-0.064
Zhujiang Square & Xiadu St	37	22	0.254	0.170

A two-mode network of users-by-venue can also be further visualized based on the data summarized in Tables 2 and 3. For illustration purposes, Figure 5 maps this location-and-activity-based spatial network, based on survey responses from a subsample of 19 local and 26 migrant residents who reported activities at 22 venues.³

Figure 5: Mapping the user-venue spatial network in Kecun



6. Social network analysis for urban built environment research

Although a major aim of our Kecun study is to demonstrate an integrated spatio-social network analysis for the measurement of urban segregation in China, our research is intended to trigger discussions regarding some broader intellectual questions. First and foremost, a key motive of our paper, as mentioned at the outset, is that SNA currently seems to be increasingly focused on the virtual internet-based space, but is decreasingly engaged with the actual urban built environment (see e.g., the editorial critique by Couclelis, 1996). Yet we see such trends in SNA as an arguable retreat from urban built environment research that attempts to study the everyday urban life taking place in the physical space and to address underlying realistic social problems.

In the above spirit, we studied segregation in Chinese cities and explored its inherent difference from the Anglo-American counterpart. Debatable as the answer is, we find that the difference is at least twofold. Socially, urban segregation in China is more based on the institutionalized divide between rural migrants and local indigenous residents rather than on racial categories as in the American case. Spatially, urban segregation in China often takes place at much smaller spatial scales, given the typically very high population density and condensed dwelling patterns featuring large Chinese cities.

The spatio-social network analysis approach we propose in this paper is admittedly just one of the many potential options to inspect social segregation in urban China. However, we showcase a feasible move beyond the traditional location-based measurement (e.g., by calculating the dissimilarity index based on census data, see Farber et al., 2014, 2015). Specifically, we demonstrate, through our Kecun study, that human activities and the associated social interactions can be captured at geographically discrete venue points, such as a food stall or a local pub, by conducting social and geographical surveys simultaneously in the field. A key advantage of this approach is that the results of our segregation measurement are less susceptible to the classic ecological fallacy and modifiable areal unit problem, because data are collected directly at the individual level (Openshaw, 1984).

The Kecun study suggests that our application of SNA fits particularly well within the urban Chinese context. Although existing research finds migrants from rural areas to be significantly segregated from local urban citizens in Chinese cities, these studies draw evidence overwhelmingly from the more formal and macroscopic aspects of urban life, such as access to housing (Liao and Wong, 2015; He et al., 2015), employment opportunities (Fan, 2003; Zhu, 2016), and social security and welfare entitlements (Liu et al., 2015). Comparatively speaking, very little attention has been paid to the more informal and microscopic everyday activities, such as grocery shopping, eating out, hairdressing, entertainment, etc. by migrants versus their local counterparts. Without understanding and assessing the routine separation between rural migrants and the local population in urban China, policy opportunities have arguably been missed to encourage social interaction and integration between the rural migrants and the local urban population.

For example, in our Kecun study, we have found that rural migrants, compared with the local urban residents, tend to ~~more often~~-visit cheaper roadside food stalls, buy medicines from informal local health clinics more often, and have to send their kids to the private (*minban*) kindergarten, because most migrant children are not recognized as local urban residents in the household registration (*hukou*) system. In general, the indigenous urban population in Kecun also tends to socialize more inwardly with their peer locals rather than with their migrant neighbors. This kind of activity-based segregation pattern is visualized in Figures 5 and 6 as well as numerically assessed in Tables 2, 3 and 4, reflecting the spatio-social outcome of the urban-rural divide observed in Guangzhou as a densely populated Chinese megacity. In this vein, the seemingly mundane segregation between rural migrants and local residents in urban China may signal some deep-seated institutional problems, such as *hukou* and the related issue of unequal development opportunities between people from the Chinese city and countryside (Fan, 2003; He et al., 2015; Liu et al., 2015).

7. Conclusion

In this paper, we propose and demonstrate an integrated spatio-social network analysis approach to measuring everyday segregation between rural migrants and local residents against an urban Chinese background. Our empirical data were collected through an integrated social and geographical survey within the central city neighborhood around Kecun in south China's Guangzhou Municipality. We find ~~that~~, within our sample of 110 local and 132 migrant residents, ~~that~~ the locals tend to socialize more actively with the other locals and ~~more often~~-visit neighborhood venues such as pubs, stadia, and public kindergartens more often. In contrast, the migrants tend to ~~more often~~-visit local roadside food stalls, outdoor recreation facilities, small health clinics, grocery malls, and private (*minban*) kindergartens more often. Overall, a modest degree of social integration ($S^{EI} = 0.026$, within a range of $[-1, 1]$) appears to exist, based on the 242 migrants' and local residents' differing spatio-social activity patterns in reference to their everyday use of the 27 selected major neighborhood amenities and open space venues.

While the research documented in this paper is primarily empirical and demonstrative, we intend to take the Kecun study as an intellectual opportunity to apply SNA for urban planning research. Although SNA may be technically sophisticated, we show through our work that these SNA models can be sensibly adapted to help us better assess and appreciate the spatio-social dynamics underlying the everyday urban life taking place within the actual urban built environment. Our future research will unfold in this direction and will hopefully generate findings that can support urban policy making in a more direct fashion.

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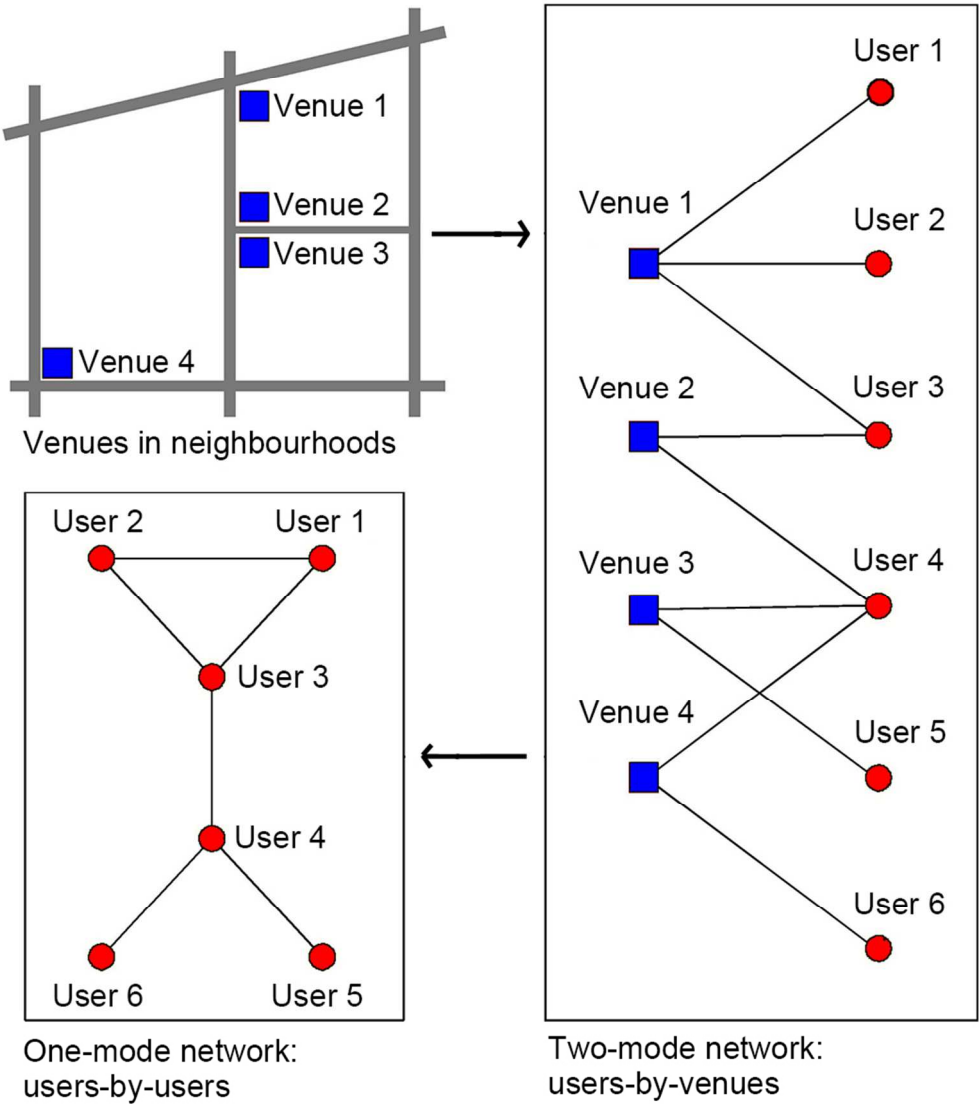


Figure 1: Two-mode versus One-mode Networks

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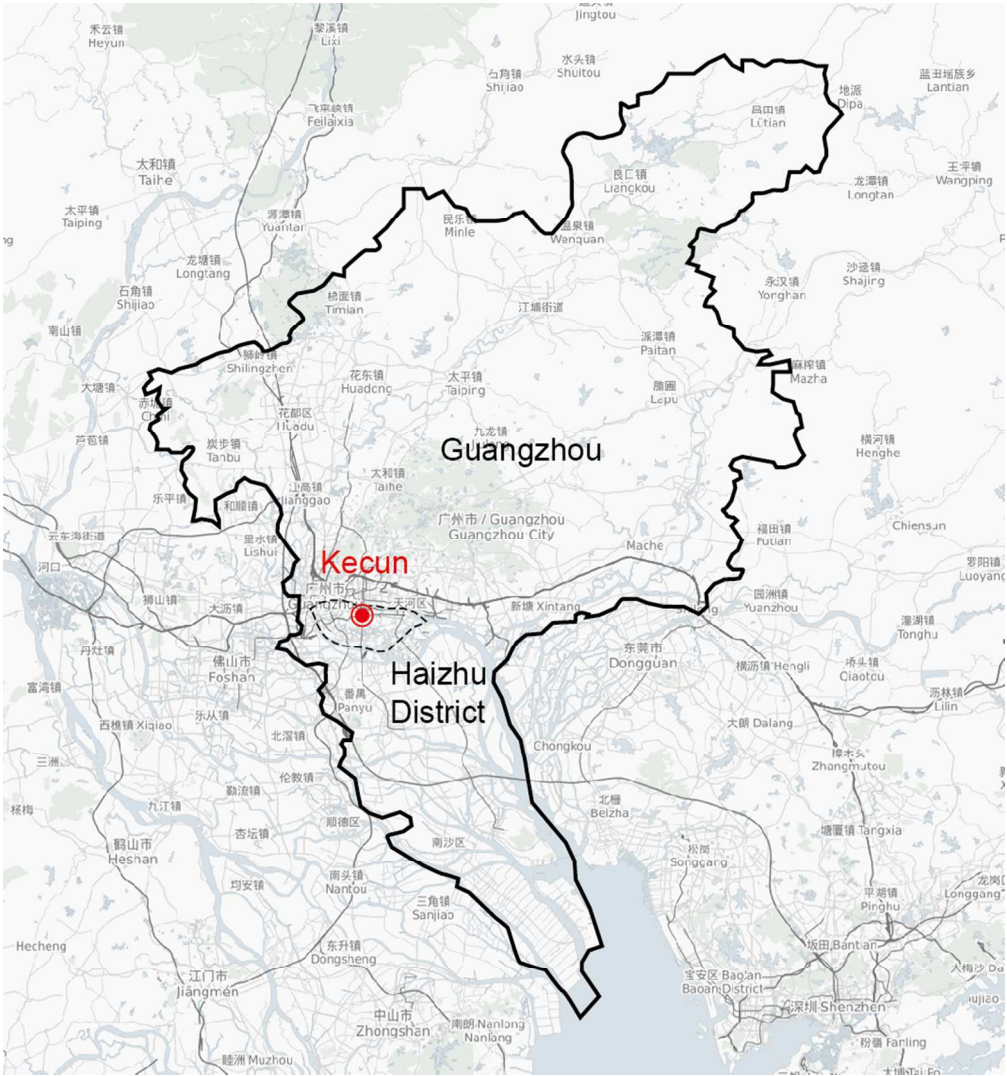


Figure 2: The Location of Kecun in Guangzhou

90x96mm (300 x 300 DPI)

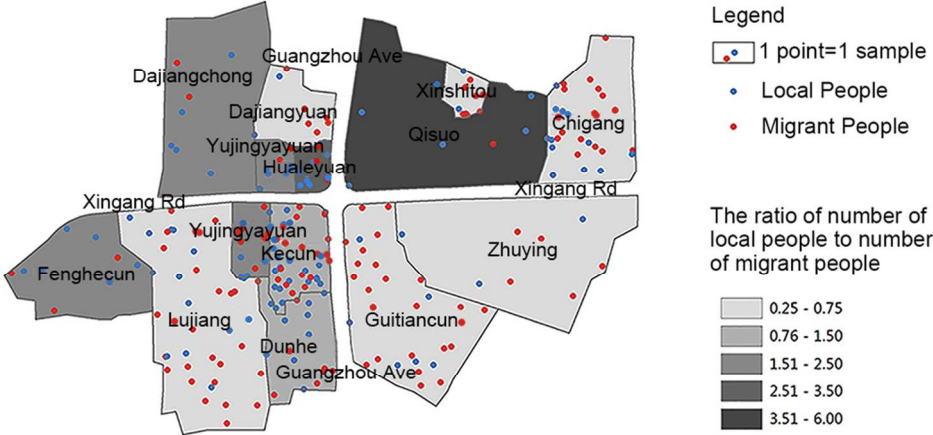


Figure 3: Mixed Dwelling Pattern in Kecun

90x45mm (300 x 300 DPI)

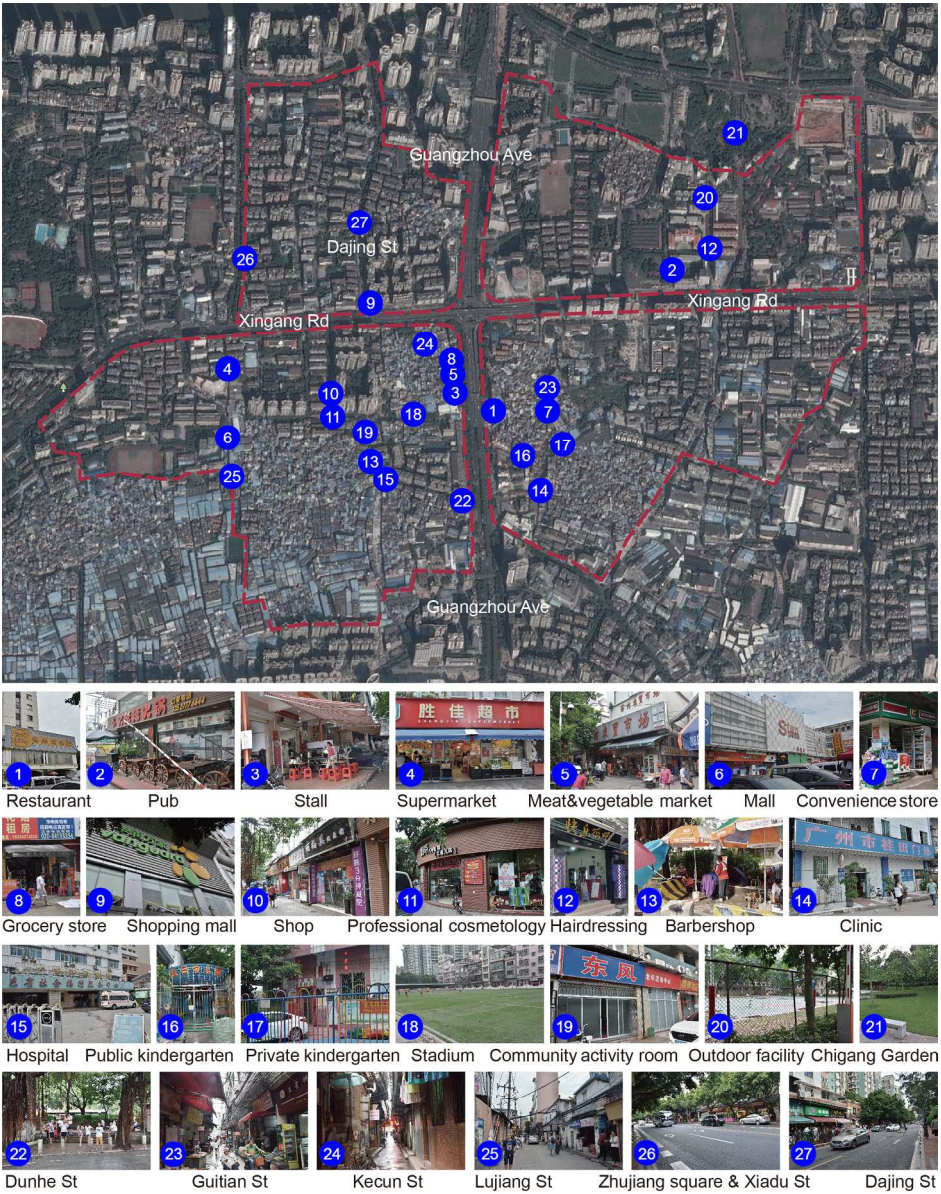


Figure 4: Selected Everyday Activity Venues in Kecun

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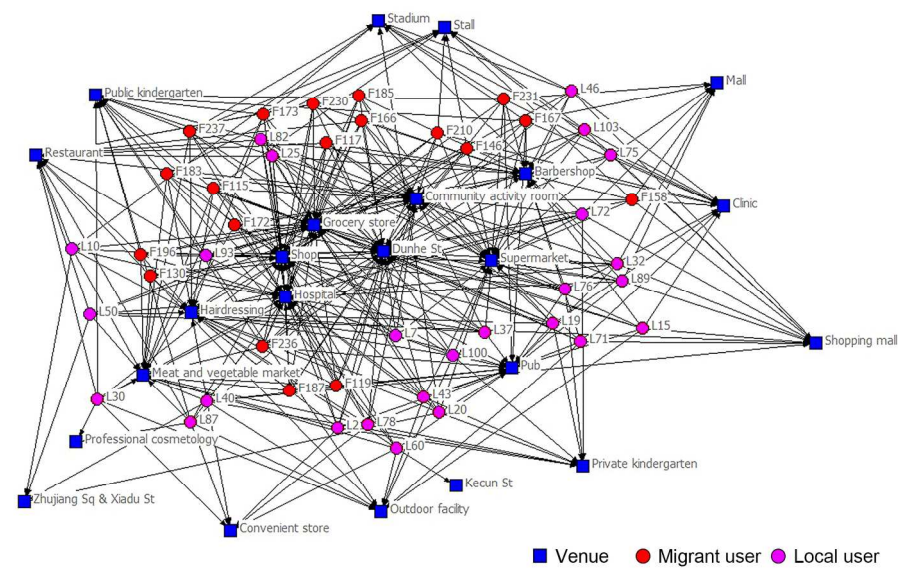


Figure 5: Mapping the Users-Venues Spatial Network in Kecun

189x109mm (300 x 300 DPI)

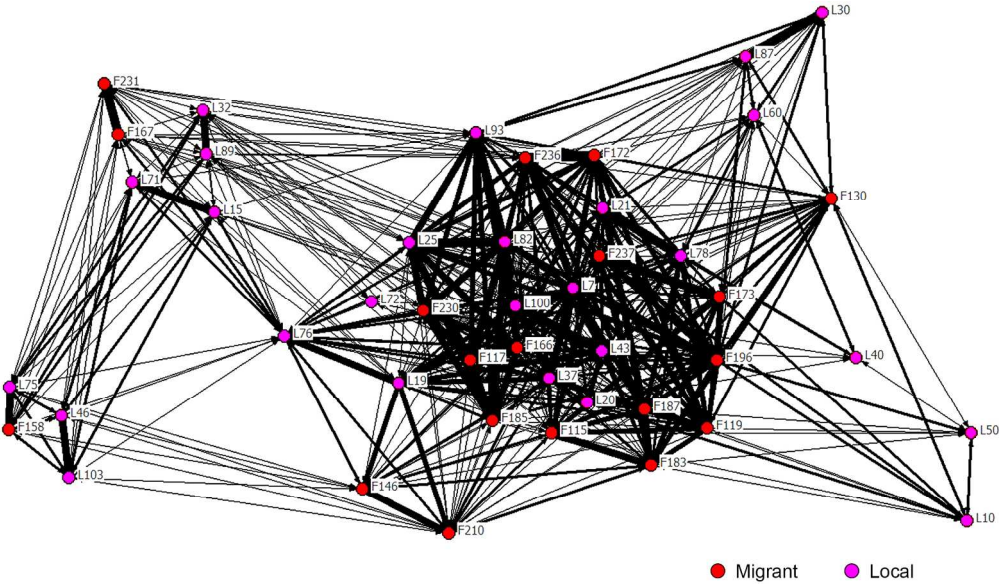


Figure 6: Mapping the Users-Users Social Network in Kecun
189x112mm (300 x 300 DPI)